REMARKS

Claims 1-5, 7-15 and 28-30 are pending and stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Teong (US Pat. 5,693,563) in view of Hegde et al. (US Pat. 6,136,682). Again, Applicants submit that at the very least, the combination of Teong and Hedge is legally deficient to establish a *prima facie* case of obviousness against claims 1 and 28 because such combination does not disclose or suggest a *damascene structure comprising a conductor having a random grain orientation, wherein a liner imparts a random grain orientation in the conductive material of the conductor to improve electromigration lifetime of the conductor,* as essentially claimed in claims 1 and 28.

Examiner acknowledges that Teong does not disclose a liner layer of an amorphous character that would impart a random grain orientation to the conductive material to improve electromigration lifetime of the conductor, but maintains that Hedge "inherently" teaches a random grain orientation of a conductive material because Hedge discloses an amorphous titanium nitride liner. Again, Applicants respectfully submit that there is *no basis for Examiner's conclusion, either technically or legally.*

Indeed, on a legal basis, both Teong and Hedge are both expressly directed to methods for forming barrier layers to prevent out diffusion of copper atoms from copper conductors into the silicon containing insulating layers. In contrast, the claimed inventions are directed to improving the electromigration characteristics of metal conductors. Examiner continues to ignore these fundamental differences. Neither Teong nor Hedge is even remotely concerned with increasing the electromigration lifetime of metallic conductors. Examiner's reliance on Teong as disclosing "electromigration" is misplaced (see p. 5 of the Office Action), and

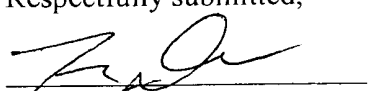
Examiner's arguments in that regard are simply disingenuous. Teong merely discloses that copper, for instance, is more resistant to electromigration than aluminum (see, Teong, Col. 1, lines 10-19). However, Examiner simply cannot point to anything in such references directed to improving the electromigration lifetime of conductors via random grain orientation.

On a technical basis, Examiner, relying on Hedge, summarily contends (on page 5 of the Office Action) that "*since the liner layer has an amorphous structure, thus a random grain orientation, that the conductive material deposited on this amorphous liner will also have the random grain characteristic due to the transfer of the amorphous structure to the deposited layer*" However, Examiner provides no technical basis for such contention, and simply assumes that any subsequently deposited metal will be amorphous, without regard for the types of liner materials used, the processing conditions, or the type of metal or manner is which the metal is deposited. Examiner cannot simply take "official notice" of such findings without some factual basis in the record. In fact, Examiner continues to dismiss Applicants' assertion in the specification that an amorphous conductor is in contrast to conventional wisdom that uniform grain orientation improves the reliability of the conductor. Again, Applicants request that Examiner submit an affidavit providing a technical and factual foundation to support Examiner's assertions of "inherency." If not, given the fact that neither Hedge nor Teong even remotely suggest increasing the electromigration lifetime of a conductor by increasing grain randomness, Examiner must withdraw the claim rejections based on "inherency."

For at least the above reasons, claims 1 and 28 are believed to be patentable and non-obvious over the combination of Teong and Hedge. Claims 2-5 and 7-15 depend from claim 1, and claims 29-30 depend from claim 28. Therefore, the dependent claims are allowable for at

least the same reasons given for the independent claims.

Respectfully submitted,



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